

**APHIS Evaluation of FMD Status of The Netherlands and Northern Ireland
October 2001**

**Animal and Plant Health Inspection Service
Veterinary Services**

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Executive Summary

This evaluation is the second supplement to an assessment conducted by the Animal and Plant Health Inspection Service (APHIS) [1] on the risk of importing foot-and-mouth disease (FMD) into the United States from animals and animal products originating from the European Union (EU). When FMD broke out in the United Kingdom (UK) in February 2001, APHIS initially considered animals and products from all Member States that it had previously recognized as FMD-free to pose a potential risk because of the open border policy that had existed prior to the FMD outbreaks in the UK including Northern Ireland, France, Ireland, and The Netherlands.

As soon as the UK reported the first outbreak on February 20, 2001, APHIS issued an administrative ban on the importation of animals and animal products from the UK including Northern Ireland [2]. APHIS followed this with an interim rule enforcing that ban [3].

When FMD spread to France, Ireland, and The Netherlands, APHIS issued an administrative ban on all animals and products from thirteen other Member States [2]. These were the states that continued to be identified as FMD-free in APHIS regulations after the UK was removed from the list of FMD-free regions.

In its initial descriptive assessment, APHIS evaluated the risk associated with export of animals and animal products from Austria, Belgium, Denmark, Finland, France, Germany, Ireland, Italy, Luxembourg, The Netherlands, Portugal, Spain, and Sweden [1]. APHIS assigned the three Member States (i.e., France, Ireland, and the Netherlands) in which outbreaks had been detected to a "higher" risk category. The ten Member States in which no outbreaks had been detected were classified as "lower" risk.

APHIS then published an interim rule to enforce the administrative ban [4]. In this rule and based on the results of its evaluation, APHIS allowed trade to resume with the Member States in the "lower" risk category and allowed them to remain on the FMD-free list. It removed only France, Ireland, and The Netherlands from the list of countries considered FMD-free. In the interim rule, APHIS agreed to re-evaluate the FMD status of France, Ireland, and The Netherlands using a regulatory process intended to facilitate animal health status recognition of regions.

When France and Ireland met the criteria of the Office International des Epizooties (OIE), APHIS reevaluated the FMD status of these areas. It solicited updated information from the Member States, conducted a site visit of the regions, and summarized its findings [5]. Based on the results of its reevaluation, APHIS reclassified France and Ireland into the "lower risk" category.

APHIS did not reevaluate The Netherlands at the time it reevaluated France and Ireland because The Netherlands had used emergency vaccination in its eradication program and had not yet met the OIE criteria for FMD-freedom [6]. However, APHIS stated its intention to reevaluate The Netherlands in the near future.

Once The Netherlands met the OIE criteria for FMD freedom of a region that practiced emergency vaccination, APHIS reevaluated its FMD status. Concurrently, because Northern Ireland was separated by water from the rest of the UK and had not reported outbreaks for over 3 months, APHIS reevaluated the status of Northern Ireland.

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In this review, APHIS presents the results of its reevaluation of the FMD status of The Netherlands and Northern Ireland. This reevaluation was conducted on the basis of documentation from each country's government that disease had been eradicated for a period of time that was consistent with OIE recommendations for a disease-free period, i.e., 90 days after the destruction of the last case or of the last vaccinated animal where vaccination is practiced.

APHIS personnel conducted a site visit, and APHIS presents a summary of its subsequent reevaluation in this document. APHIS was unable to identify risk factors remaining after disease was eradicated in these Member States. Therefore, APHIS reassigned The Netherlands and Northern Ireland to the "lower" risk category.

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Introduction

On February 20, 2001, FMD was detected in the UK. Disease subsequently spread throughout the UK including Northern Ireland (February 21, 2001), and was confirmed in France (March 12, 2001), Ireland (March 20, 2001), and The Netherlands (March 21, 2001) [7].

Following the initial outbreak in the UK, APHIS issued an administrative ban on importation of animals and animal products from the UK including Northern Ireland [2]. APHIS ultimately reinforced this ban with an interim rule, incorporating the ban into its regulations [3].

In response to the outbreaks in France, Ireland, and The Netherlands, APHIS issued a second administrative ban that prohibited imports of susceptible animals and their products from the thirteen remaining EU Member States that APHIS had recognized as free of FMD at the time of the outbreaks [2]. This action did not affect Greece since Greece was not recognized free at the time the ban was implemented.

Before implementing an interim rule removing all thirteen of the Member States from its FMD-free list, APHIS evaluated the risk of exporting infected animals and animal products. This evaluation considered risks that might (1) operate at the level of the European Community and affect all Member States, and might also (2) apply specifically to the situation in an individual Member State [1].

Although it recognized the risks involved with factors such as swill feeding and the significance of the large amounts of virus that can be spread from an extensive outbreak, APHIS identified the actual occurrence of outbreaks in an individual Member State as the factor contributing most to the risk of exporting infected animals or products. Contributing to this risk was the observation that, in accordance with European Commission (EC) legislation, no affected Member State meets the waiting period requirement prescribed by the Office International des Epizooties (OIE) for recognizing a region as free from FMD [6]. Rather, EC legislation allowed restrictions to be lifted 30 days after the last case of disease had been eliminated [8].

In its initial evaluation of the entire EU, APHIS classified each of the thirteen Member States into two general categories, one of "higher" risk and one of "lower risk." Primarily because of the outbreaks, France, Ireland, and The Netherlands were assigned to the "higher" risk category. Since APHIS could identify no risk factors that it felt could justify removing all of the Member States under consideration from its list of FMD-free regions, the ten remaining Member States were assigned to the "lower" risk category. By implication, although not stated directly in either the initial assessment of the continental Member States, APHIS classified the UK including Northern Ireland in the "higher" risk category.

APHIS then enforced its second administrative ban by publishing an interim rule removing France, Ireland, and The Netherlands from the list of countries recognized as free from FMD [4]. APHIS allowed trade with Austria, Belgium, Denmark, Finland, Germany, Italy, Luxembourg, Portugal, Spain, and Sweden to resume. In its original evaluation, APHIS indicated that it would reevaluate the Member States impacted once they had met OIE criteria for FMD freedom.

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Subsequently, France and Ireland provided information suggesting that FMD had been eradicated and that these Member States had met the OIE criterion for a disease-free period after eradication. APHIS personnel conducted a site visit and reevaluated the FMD status in these Member States. Based on its reevaluation, APHIS assigned France and Ireland into the "lower" risk category.

Because The Netherlands included vaccination in its eradication program, this Member State was unable to meet the OIE criterion for freedom with emergency vaccination as early as France and Ireland met the criterion for freedom without vaccination. Therefore, The Netherlands was not included in the evaluation of France and Ireland but was to be reassessed at a later date, once it fulfilled the OIE criteria for FMD freedom in a region where emergency vaccination was practiced. Once it met those criteria, APHIS conducted a site visit as part of its reevaluation process. This document presents the results of that reevaluation.

Since Northern Ireland had experienced no outbreaks in more than 3 months and was separated from the remainder of the UK by water as a natural boundary, APHIS concurrently reevaluated the FMD status of Northern Ireland. Those results are also presented here.

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Objective

The objective of this review is to evaluate the risk associated with the resumption of trade in susceptible animals and animal products from The Netherlands and Northern Ireland as a follow-up to a previous evaluation of these regions [1]. The reevaluation is intended to provide a basis for evaluating the risk of recognizing The Netherlands and Northern Ireland as free from FMD and reinstating these regions to the APHIS FMD-free list.

APHIS Approach to Regionalization

The Netherlands and Northern Ireland provided information to APHIS regarding the status of their FMD eradication efforts. In addition, a team of APHIS personnel conducted a site visit to validate the information provided and to evaluate the situation in these regions. The team's reports [9, 10] published literature, EU legislation [8], documents provided by the EC, and reports to the OIE [7] constitute the supporting documentation for this reevaluation.

Evaluation Format

This document represents a supplement to an initial assessment [1]. As such, it relies on the initial assessment for details of the scope of the evaluation, information requested from the Member States, a summary of EC legislation, and a statement of the OIE recommendations on waiting periods to reestablish disease-free status in regions that have experienced FMD outbreaks.

The two OIE criteria that are applicable to this reevaluation of the FMD status in The Netherlands and Northern Ireland will be reiterated for completeness. Applicable to The Netherlands is the criterion that, when FMD occurs in an FMD-free country or zone where emergency vaccination is practiced, 3 months must lapse after the last vaccinated animal has been destroyed where stamping-out and serological surveillance and emergency vaccination are applied [6]. The last vaccinated animal in The Netherlands was destroyed on May 25, 2001.

Applicable to Northern Ireland is the criterion that, when FMD occurs in an FMD-free zone where vaccination is not practiced, 3 months must lapse after the last case when stamping out and serological surveillance are applied. The last case in Northern Ireland was detected on April 20, 2001, and the animals were slaughtered immediately.

Information on FMD in The Netherlands and Northern Ireland

The Netherlands [10-16]

Foot-and-mouth disease was confirmed in four provinces in The Netherlands. These were (1) Noord Veluwe; (2) Kootwijerbroek, (3) Oosterwolde, and (4) Noord Friesland [Figures 1-4]. Twenty-four outbreaks were confirmed in The Netherlands (26 premises). Outbreaks 1-7, 11-21, 23-24, and 26 were reported in Noorde Veluwe, including Olst and Wijhe. Outbreak 8 occurred in Kootwijerbroek. Outbreaks 9 and 10 occurred in Oosterwolde. Outbreaks 22 and 25 occurred in Noord Friesland.

Outbreak chronology

February 20	The first outbreak of FMD was confirmed in the UK.
February 28	FMD was confirmed in Meigh, Northern Ireland.

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March 13	FMD was confirmed in Mayenne, France.
March 21	FMD was confirmed in Olst, The Netherlands.
March 28	FMD was confirmed in Kootwijkerbroek, The Netherlands.
March 28	FMD was confirmed in Oosterwolde, The Netherlands.
April 11	FMD was confirmed in Noord Friesland, The Netherlands

Sequence of events in The Netherlands

February 23	Animals identified as imported on February 22 from the UK were culled. At about the same time, collection centers were banned to prevent mixing of animals.
March 15	Clinical signs were observed in dairy goats on a farm in Oene. Serological results on an ELISA test were negative.
March 16	<ul style="list-style-type: none"> Animals identified as imported into The Netherlands from France were culled. In a separate event, clinical signs were observed in goats in another part of the stable on the same farm in Oene mentioned above (See March 15). ELISA results were doubtful.
March 17	Goats on the farm in Oene were culled preemptively. Samples were taken for virus isolation.
March 20	Clinical signs were observed in dairy cows on a mixed farm (dairy and goats) in Olst.
March 21	FMD was confirmed serologically in cattle in Olst. The farm had received animals from the UK via France.
March 22	FMD was confirmed by virus isolation from goats located on the previously mentioned premises (see March 15 and 17) in Oene.
March 26	Practice of suppressive vaccination was initiated in Oene and Olst.
April 3	After 12 infections were confirmed in Noord Veluwe, suppressive vaccination was initiated in the region.
April 22	The last case of FMD was detected in The Netherlands in Wijhe.
May 25	The last vaccinated animal was culled.
June 25	The Netherlands became FMD-free by EC criteria.

Comments

Before the end of the outbreak, 26 cases were confirmed in a total of seven restricted areas. Animals from approximately 3,000 farms and 1,000 small backyard flocks were culled, for a total of about 265,000. Daily operations for the eradication effort involved 200 veterinarians, 400 assistants, and 150 administrative personnel.

Level of preparation

Normal veterinary activities as well as the additional activities required by the outbreaks were coordinated among several governmental units within and outside the office of the Minister of Agriculture, Nature Management and Fisheries with specifically defined functions and lines of communication among participating agencies. These include the office of the Veterinary and Food Policy and Environment (responsible for trade control and animals health issues), the National Inspection Service (responsible for executing legislation), and the General Inspection Service (responsible for compliance activities). Product boards that participate in development of regulations and funding operations for the eradication effort also constitute part of the veterinary infrastructure in The Netherlands.

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Veterinary officials in The Netherlands initiated preventive measures before disease was confirmed in the country, immediately after outbreaks in the UK and France were reported. After these outbreaks, officials traced all imports of biungulates from the UK and pre-emptively culled those farms that housed sheep and deer. In addition, veterinary officials conducted clinical and serological inspections of farms that had received imported pigs. All serological tests results from biungulates were negative. In addition, transport of sheep and goats was banned, and a requirement was instituted to clean and disinfect lorries after unloading biungulates.

Although the outbreaks in the UK and France provided The Netherlands with some opportunity to prepare for their own outbreaks, the most valuable lessons for dealing with the FMD situation were learned during the Classical Swine Fever (CSF) outbreak in The Netherlands in 1997 and 1998. Those lessons were applied to restructuring of the pig sector, including development of sanitary measures for transportation between and within collection centers and institution of additional requirements for collection centers. In addition, the experience underlined the significance of cleaning and disinfection of every farm and the need to minimize contacts between epidemiological units. Also, the need for vigilance and an early warning system was learned. This lesson resulted in institution of the routine practice of compulsory monitoring of clinical symptoms by a veterinarian (every four weeks) on a pig farm.

A practice adopted during the CSF outbreaks to facilitate the mobilization of resources also proved effective during the FMD situation. This was the value of contractors to provide certain services. Significant use was made (and continues to be) in The Netherlands concerning the institution of such contracts. For example, vaccine is manufactured under contract in Lelystadt. In addition, the Institute of Animal Health and Husbandry was responsible for conducting vaccination. Moreover, contracting organizations set up and coordinated daily activities in local crisis centers.

Special funding arrangements have been devised to pay for eradication activities. Some of the funds, which are administered through Product Boards, come from levies placed on animals and commodities.

Traceback

As in other Member States, tracing of imported animals was initiated through the ANIMO system. However, in addition, The Netherlands has a national system with a Central Database (CDB) that is part of the Identification and Registration of database. Transport of pigs between farms may occur only after authorization within the CDB. A measure already in place at the time of the outbreak that facilitated tracing was the restriction that every pig may be moved between farms only once in its lifetime.

Epidemiological investigations linked many of the outbreaks. However, despite extensive epidemiological investigations, the source of the infections in Noord Friesland was not detected.

Slaughter/Vaccination Policy

As previously mentioned, susceptible species imported from France and Ireland were culled. Additional slaughter was conducted in the context of a vaccination policy.

Although vaccination was not part of the original contingency plan in place for The Netherlands, vaccination was included in the eradication plan to address several issues encountered during the control effort. The effort was facilitated by the fact that vaccine was

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manufactured in Lelystadt, and so vaccine was readily available in The Netherlands. In this regard, authorities in The Netherlands instituted contract measures that gave them priority over others in the sale of vaccine manufactured at Lelystadt to other countries in order to ensure sufficient quantities for the vaccination program.

A vaccination policy was adopted because the cull volume was too large to allow disposal of the carcasses in a timely fashion. In this regard, the rule followed in The Netherlands was that, after confirmation of an infected farm, preemptive culling of that and any associated farms had to be completed within four days. A related factor was that it was necessary to destroy animals in The Netherlands by rendering. Neither burning nor burying were considered to be viable options.

This led initially to the use of suppressive vaccination within a radius of 2 km around the infected farm. Roadblocks were established around the vaccination areas to prevent movement of animals. Vaccinated animals were identified by ear punch to facilitate identification for ultimate culling.

In spite of this process, new outbreaks occurred outside the vaccination zones. Where this happened (i.e., Noord Veluwe), the vaccination area was expanded to a larger area defined by natural boundaries.

Also, occasionally, vaccinated animals were diagnosed with disease. This usually occurred within a few days after vaccine administration, suggesting that the animals were exposed prior to vaccination.

Surveillance

All sheep in The Netherlands were clinically inspected at least once before September 8, 2001. Sheep in slaughterhouses were selected randomly for serological testing. Farms with veal calves were monitored for clinical signs at least once every four weeks and tested serologically. Transport was allowed only with a document issued by the veterinarian.

Once it appeared that the outbreak was over in The Netherlands, a final screening was conducted. In the protection zone, the protocol included clinical inspection of all premises, administrative checks, and serological tests on farms with sheep, goats and dairy cattle less than 2 years of age. The administrative checks focused on herd management during specified periods before screening. Management issues addressed included the number and type of sick or dead animals and the use of medicines. In the surveillance zone, the protocol included inspection for clinical signs, administrative checks, and serological tests on samples from 150 farms selected at random.

Serological sampling in the protection zone was based on collection of a sample size that would detect a within-herd prevalence of 5% at a 95% confidence level. The number of 150 farms that was selected for assessment in the surveillance zone was based on a protocol that would detect a between-herd prevalence of 2% with 95% confidence.

No evidence of remaining FMD was detected, and The Netherlands considered itself FMD-free by EC criteria on June 25, 2001.

Import restrictions on high-risk products

In addition to its normal import restrictions, The Netherlands is taking a proactive approach to assessing risk of imported animals and products. Based on the premise that there can be no

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eradication without prevention, The Netherlands is developing a risk analysis model to screen importations of animals and animal products in order to assess the level of risk they might pose. The assessment of risk is based on risk factors weighted as deemed appropriate by technical experts to the animal or product in question, the disease, trade volumes. The system analyzes risk in the context of the port of arrival and the mode of transport. It also assesses the effects of mitigation procedures.

Measures implemented in surveillance and control zones

A Departmental Crisis Center (management level unit) for strategic decision-making was formed at the Ministry of Agriculture when FMD broke out in the UK. A National Crisis Center, coordinated through the National Inspection Service and located in the Hague, provided technical support. The National Crisis Center cooperated with Regional Crisis Centers that were established in the outbreak areas. These regional centers implemented the program at the local level and were run by an organization under contract to the Ministry.

Confirmed infected farms were culled. Protection and surveillance zones consistent with EC legislation were established. Protection zones routinely had a radius of 4 km. Surveillance zones were 10 to 12 km in radius, depending on local conditions. Of note is that zone size exceeded EC requirements. Susceptible species within a 1 km radius of the infected farm were culled preemptively. All farms within the protection zone were screened for clinical signs.

As part of requirements in place at the time of the outbreak, cattle moved from farms were not only collected under strict conditions; they were also allowed to move only to designated locations. After an animal was moved from a farm, a 30-day quarantine was placed on the receiving farm (unless the animal was moved directly to slaughter).

For animal movement purposes, the country was divided into regions in an approach called compartmentalization. Pathways of animal movement from zone to zone were strictly controlled. Pathways were defined to address risk associated with movement of various types of susceptible animals, such as veal calves or dairy cattle. Special zones were defined in the context of control of veal calf movement and in order to eliminate the need for collection centers. For example, a zone might receive veal calves from only one other zone. Dairy cows were only allowed to move within the zone and were not exported outside.

Restocking

Restocking was allowed 2 weeks after cleaning and disinfection of an infected premises. Animals intended for replacement had to be tested serologically on two occasions (after 2 weeks and after 30 days). Test results had to be negative. Animals for replacement on premises that were not infected but were culled did not have to be tested.

Swill feeding

Swill feeding has been prohibited in The Netherlands since 1989-1990. EC regulations provide support for the ban. Although there may be some degree of non-compliance with the ban, the level of non-compliance is unknown. However, there was no evidence that swill feeding was a risk factor in The Netherlands.

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Compliance with measures

A significant level of public resistance to the cull was documented in some parts of the country. Culling teams were actually stopped and taken hostage. However, it was possible to take the appropriate measures with police participation and protection.

The process of culling in other areas was hampered because of lawsuits filed by farmers against the Ministry of Agriculture. These were resolved, and the necessary culling was completed.

Northern Ireland [9, 17-25]

(Figure 5)

Sequence of outbreaks in Great Britain and Northern Ireland

February 20	An outbreak was confirmed in Great Britain (Essex, England). Officials in Northern Ireland began tracing back animals imported since January 23. Community restrictions were placed on animals imported from the UK.
February 27	Outbreak 1 in Northern Ireland was detected in Meigh, near border with the Republic of Ireland.
April 10	Outbreak 2 (the first to occur in Ardboe/Coagh) was detected in Ardboe.
April 14	Outbreak 3 was detected in Cushendun.
April 20	Outbreak 4 (the second in Ardboe/Coagh) was detected in Ardboe.

Brief chronology of events in Northern Ireland

February 28	Animal movement and the holding of livestock auctions and markets in Northern Ireland were banned for several days, except for animals sent to slaughter.
March 6	An animal movement licensing system was introduced to prevent movement of animals from restricted zones and holdings and to record the movement of animals for epidemiological purposes (especially sheep).
March 15	To address animal welfare issues, the licensing action was extended to allow movement between premises.
March 22	An outbreak was confirmed in Proleek, Republic of Ireland, immediately across the border from Meigh.
March 29	A cull coordinated with the Republic of Ireland was initiated in the cross-border area between the protection zones in Meigh, Northern Ireland, and Proleek, Republic of Ireland.
March 30	Further adjustments were announced to the licensing system, including introduction of general licenses and extended welfare movement.
April 14/15	Licensing actions were suspended, and licenses were rescinded because of outbreak in Cushendun.
April 23	Animal movements to slaughter were resumed.
April 25	Licensing for animal movement from restricted zones or holdings was resumed.
June 7	EC restrictions were lifted.

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Information on Outbreak 1 (Meigh)

The origin of this outbreak was identified through traceback as an illegal importation of sheep from a lairage (animal collection center) in Scotland. Traceback of animals imported after January 23 identified a premises in Meigh that had received infected animals. The premises was inspected by an Epidemiology Team Member (ETM) on February 27, at which time lesions were identified in sheep.

The premises was owned by a dealer who traded calves and sheep across the border of the Republic of Ireland. A 3 km control zone was established around the premises. The surrounding surveillance zone crossed the border into the Republic of Ireland.

Subsequently, on March 19, symptoms were observed in sheep in Proleek, Republic of Ireland, immediately south of Meigh. Although no direct link was established, there was some indication that disease may have spread through an intermediate flock. Northern Ireland and the Republic of Ireland participated in an extended cull covering communal grazing areas extending across the borders.

Information on Outbreak 2 (Ardboe)

Symptoms were reported in young cattle (6 months of age) in an isolated outbuilding on a farm in Ardboe. An ETM inspected the premises and found lesions that appeared to be 2-7 days old. On April 13, vesicles, were observed in two cows at the home farm. On April 20, a ewe at the home farm was sampled serologically and the results were positive. Epidemiological investigation suggested that the infection originated from contact with a contaminated visitor that probably occurred between March 28 and March 30.

Information on Outbreak 3 (Cushendun)

On April 14, symptoms were reported from a premises in Cushendun. An ETM inspected the premises and observed lesions in cattle and sheep. The cattle lesions were estimated to be 2 days old or less; and the sheep lesions, approximately ten days old. The infection spread subsequently to two outfarms. In this case, movement of sheep appeared to have been responsible for spread of the disease. Epidemiological evidence suggested that the original source might have been an illegal consignment infected before entry into Northern Ireland.

Information on Outbreak 4 (Ardboe)

On April 20, symptoms were reported in fattening cattle on a premises approximately 1 km from Outbreak 2. An ETM inspected the premises, observed lesions, and estimated the lesions to be less than 2 days old. The origin was thought to be a contaminated visitor who had visited the premises on which Outbreak 2 occurred a few days previously.

Comments

Level of preparation

Northern Ireland received advanced notice of the potential for FMD infection as a result of the outbreak in Great Britain and was able to act quickly. In this regard, the first case was identified through tracing of sheep imported from England/Scotland.

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Traceback

Traceback was accomplished through the ANIMO system and Northern Ireland's national system, i.e., its Animal and Public Health Information System. Northern Ireland's Animal and Public Health Information System is a computerized database with capabilities for identification and registration of animals (primarily cattle); recording of animal movements; and monitoring of imports, exports and certification. Every registered bovine in Northern Ireland is identified by a unique tag number assigned by the system. The system facilitated tracing of animals significantly. Ultimately there are plans to have remote input from individual premises, although that is still in the planning stage.

The system can produce a full movement history for all bovines in a herd or for an individual animal in a herd. It contains records of test histories for all animals in Northern Ireland since 1988. Officials in Northern Ireland indicated that the tracing system made it difficult to smuggle bovines into the country. However, the system does not document sheep or swine.

In addition to the records in the ANIMO and Animal and Public Health Information Systems, shipping manifests, records maintained at markets, and Import Inspectorate records were evaluated as part of the traceback system. Comparison of these records contributed significantly to the epidemiological investigations.

Slaughter policy

Foot and mouth disease susceptible livestock on infected premises were slaughtered and incinerated on the premises. Borders of the surveillance zone were usually designed to follow geographical features in the area. Susceptible species within 1 km of the infected premises were culled. Additional culling occurred within the 3 km zone as considered appropriate to the situation. Infected premises were subsequently cleaned and disinfected according to a defined protocol.

Surveillance

During the outbreak period, all susceptible livestock on all holdings within the 10 km zone were examined clinically. In addition, serum samples were taken from specified numbers of sheep and goats at selected farms and susceptible species with suspect clinical signs within the surveillance zone.

Subsequent to the outbreaks, a national serological survey in sheep was conducted. The survey focused on sheep as inapparent reservoirs of disease. Ultimately, in a sequence based on risk levels established by veterinary officials with sampling of high risk populations first, the strategy was to sample all flocks in the country at levels that would detect FMD if it occurred at a 5% prevalence level with 95% confidence. This sampling strategy applied to all herds except for flocks of less than 60 sheep, in which case all sheep would be sampled. The strategy called for all "non-negative" tests to constitute a trigger for a detailed epidemiological investigation. The survey did not detect FMD. Cattle were not included in the survey.

Measures implemented in zones and at national borders

Control measures on infected premises

When suspect FMD was reported, a local veterinary officer visited the premises. If FMD could not be ruled out, an ETM visited. Based on the diagnosis and consultation with officials in the

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local control center, samples were taken, the premises restricted, and animals slaughtered. Protection (3km) and surveillance zones (10 km) were defined.

Suspect premises were subject to movement restriction of animals, animal products, people, vehicles, utensils, and fodder and waste materials. Even if FMD was not confirmed, suspect premises were visited daily.

Licensing procedures for animal movement

Immediately after the outbreak, animal movement was prohibited until a licensing program was developed to control that movement. Licensing procedures were put in place to prevent the movement of animals from restricted zones or holdings and to record the movement of animals for epidemiological purposes. Licenses were required for movement by road or across another holding. Licenses also limited the movement pathway of animals by requiring that they move directly from origin to destination. Vehicles carrying the animals had to be cleaned and disinfected before and after each journey.

Additional restrictions were applied on a species basis. For example, live sheep were not allowed to move, except directly to slaughter. Occupational licenses were granted for the movement of dairy cattle. Specific licenses were issued for cattle within a business, subject to a 21-day movement standstill. Pigs were allowed to move between related holdings subject to clinical inspection at both points of origin and destination. Horses were allowed to move within the country under specific or occupational licenses.

Animal product issues

Trade in meat and untreated products from susceptible species was prohibited by EC legislation. Certification was required for products that were eligible for trade. Animals from surveillance zones going to slaughter were specially marked. Disposal of blood, slurry, rumen contents and milk residues as waste from plants was controlled.

Border ports

Because of its border on the sea, Northern Ireland expended significant resources on control of entry through both air and seaports. Animals and animal products from Great Britain were prohibited. Ferries from the UK were subjected to particular scrutiny. Vehicles coming off the ferry must go through spray disinfectant. Before being sprayed, cars are stopped, and passengers were interviewed by inspection personnel.

Public announcements were made in airports, encouraging passengers not to enter prohibited material. Passengers were required to walk through disinfectant mats.

Restocking policy

Guidance for restocking comes from the UK policy [23]. In summary, clinically normal animals may be introduced at least 21 days following the completion of full cleaning and disinfection of the infected premises. Animals can only be moved onto the premises under license. All animals (all species) must be blood sampled on arrival. They must be subjected to regular clinical examinations once a week for four weeks and random blood samples taken for FMD testing at least 28 days after introduction to the premises (all species).

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Swill feeding

Swill feeding is controlled by EC legislation [24]. Specifically, feeding of international garbage is prohibited, and other swill must be heat-treated. However, in addition to the existing restrictions, the UK is considering a proposal to ban swill feeding in the UK [25].

Compliance with measures

The political climate in Northern Ireland presented some difficulties with compliance at the local level. However, the government made a significant effort to educate, inform, and maintain lines of communication with the public concerning the significance of the problem. It provided a mechanism to the public for confidentially reporting suspected illegal movements.

Enforcement and investigations involved cooperation between veterinary officials from Northern Ireland (both local and from headquarters) and England, officials from the Republic of Ireland, full-time enforcement staff, Army, and police. During the period of most active investigation, personnel from several other units (including the Fraud Unit and the Intervention Board) were temporarily reassigned to the Veterinary Service. Several investigations of illegal activities are ongoing.

National legislation

The scope of legislative authority in Northern Ireland is broad. In this regard, the Foot and Mouth Disease Order of 1962 provides a veterinary inspector with authority to "prohibit the movement of any person, animal carcass or thing to or from any place" [26].

In addition, national legislation includes provisions for Northern Ireland to declare itself as a "controlled area" [26]. This means that, "Where the Ministry considers it necessary or expedient for the prevention of the introduction or spread of disease it may by Order declare Northern Ireland or any specified part or parts thereof to be a Controlled Area for the purposes of this Order." Designation as a controlled area means that no animal or undressed carcass may be moved out of the area except to a contiguous infected area under license and no animal may be moved into a controlled area except direct to farm or slaughterhouse under license. Northern Ireland remained a controlled area at the time of the APHIS site visit in July 2001, and the designation has been extended. Officials in Northern Ireland indicated no immediate intention to change the designation, which was intended to maintain a national focus on the potential for reintroduction of the disease.

Summary and approach to evaluation of risk factors

In its initial evaluation, APHIS identified the occurrence of an outbreak as the major risk factor associated with animals and products exported to the United States. Therefore, eradication of disease should mitigate that risk.

Duration of restrictions

In its initial analysis, APHIS noted that occurrences of disease in Northern Ireland and The Netherlands were separated by a disease-free period that approximated the length of time specified by EC legislation for maintenance of control zones (i.e., 30 days). APHIS expressed the concern that disease might occur after restrictions were lifted and animals and products had begun to move in commerce.

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Ultimately, however, a longer disease-free period, one that was at least consistent with OIE criteria, was maintained in both regions. Specifically, the case in Northern Ireland occurred on April 20, 2001, and the last case in The Netherlands occurred on April 22, 2001. Animals were culled immediately. The last vaccinated animal in The Netherlands was killed on May 25, 2001. In both countries, the last FMD case occurred more than 3 months prior to the site visit by APHIS personnel. In The Netherlands, the last vaccinated animal was killed almost 3 months prior to the site visit conducted by APHIS personnel.

Spatial aspects of outbreaks

In the initial assessment, APHIS noted that outbreaks in The Netherlands occurred outside restriction zones approximately 100 km from affected areas. Outbreaks outside restriction areas were also observed in Northern Ireland and France. The origin of some of the distant outbreaks in The Netherlands has not been identified. APHIS expressed the concern in its original assessment that unexplained long-distance movement of disease could contribute significantly to risk.

In the absence of any other explanation, APHIS attributed the unexplained long-distance spread to an increased risk of FMD transmission while virus availability remains high. Eradication of the disease and the maintenance of freedom for several months mitigates this concern to a significant degree.

Conceivably, however, disease could still spread from Great Britain. Recent reports suggest that the prevalence of outbreaks in the UK is significantly reduced since its peak [27], even though there has been a recent upsurge in cases in certain areas. However, no additional spread to other Member States has been documented. These observations suggest that availability of the virus is reduced significantly in the region as a whole and spread from Great Britain to other regions is under control.

Risk Factors applicable to The Netherlands and Northern Ireland

APHIS could identify no additional risk factors applicable to either The Netherlands or Northern Ireland.

APHIS cites the following factors as relevant to the situation in The Netherlands:

- No new outbreaks have been detected more than 3 months after the last vaccinated animal was killed.
- The Netherlands was able to effectively control disease despite a very high density of pigs.
- Officials in The Netherlands had learned valuable lessons from the 1997-98 experience with the outbreaks of CSF, many of which were applied to the FMD situation.
- Officials in The Netherlands were able to make effective use of contractors to coordinate the vaccination effort and local crisis center activities, mobilizing resources very quickly.
- The Netherlands banned movement of animals through collection centers.
- Lines of communication among participating governmental units were well-defined and effective.
- Officials made effective use of a suppressive vaccination that was appropriate for the local conditions.
- Surveillance to confirm disease eradication has been effective.
- A risk assessment model is being developed to proactively assess import risk.
- The Netherlands has provided routine updates regarding the situation.

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APHIS cites the following factors as applicable to the situation in Northern Ireland.

- No new outbreaks have been detected more than 3 months after the last case was diagnosed.
- Northern Ireland continues to maintain vigilance by maintaining its national classification as a control area.
- Northern Ireland limited disease occurrences to a relatively low number (four).
- Northern Ireland has broad regulatory authorities.
- Northern Ireland maintains special vigilance at its seaports.
- Northern Ireland's regulatory authorities are broad.
- Northern Ireland has provided routine updates regarding the situation.

Evaluation

A team of staff officers from APHIS, Veterinary Services, evaluated the risk and developed a general consensus opinion on the relative risk for Northern Ireland and The Netherlands in the same context as described in the evaluation for France and Ireland and the assessment of the thirteen EU Member States.

In the absence of specific criteria to assign risk levels, risk categories applied were "lower" and "higher." In the original assessment, because of the outbreaks, the "higher" risk category was assigned to The Netherlands and implied for Northern Ireland. In this re-evaluation, The Netherlands and Northern Ireland were reassigned to the "lower" risk category.

Figure 1: Outbreaks in Noord Veluwe

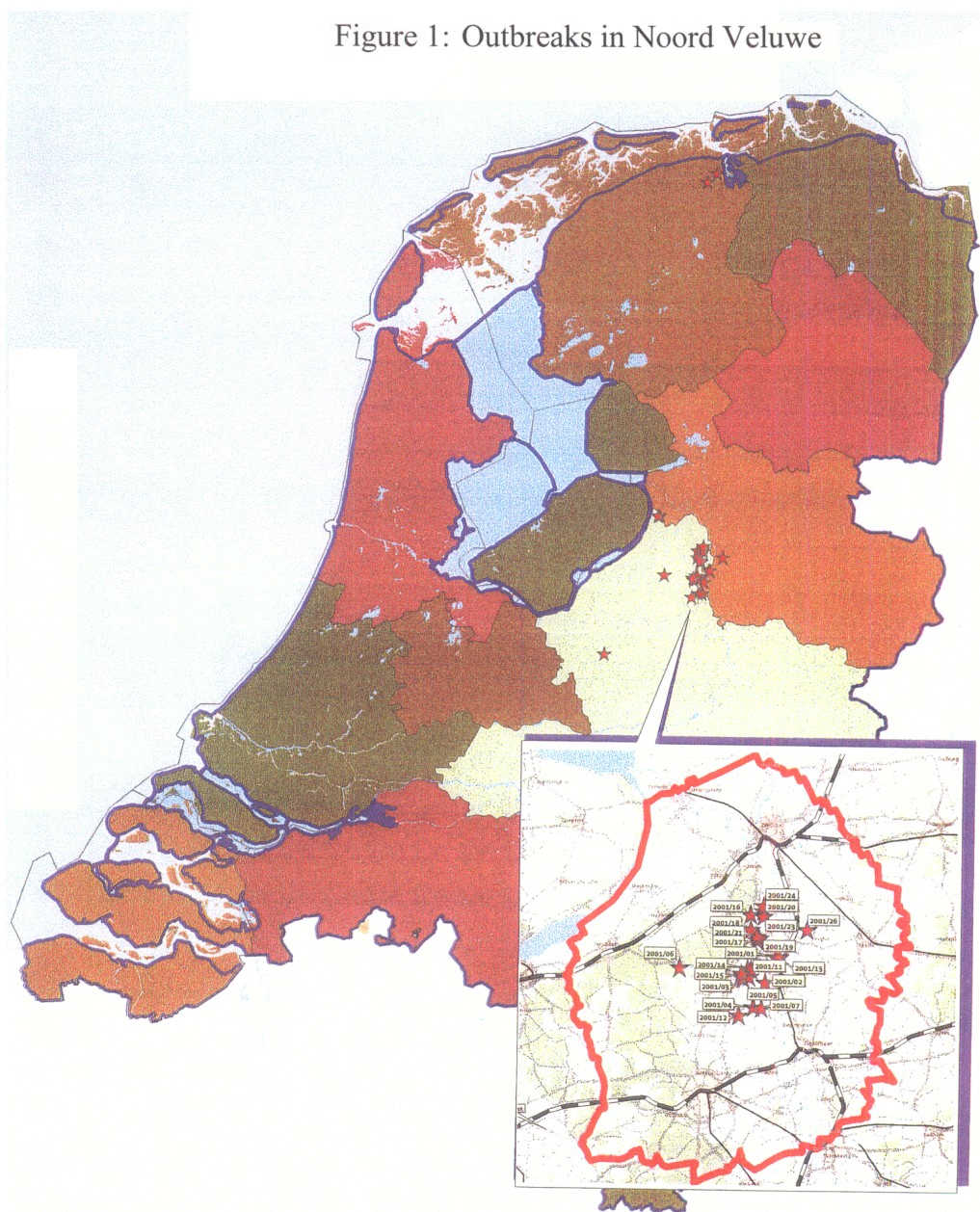


Figure 2: Outbreaks in Kootwijkerbroek

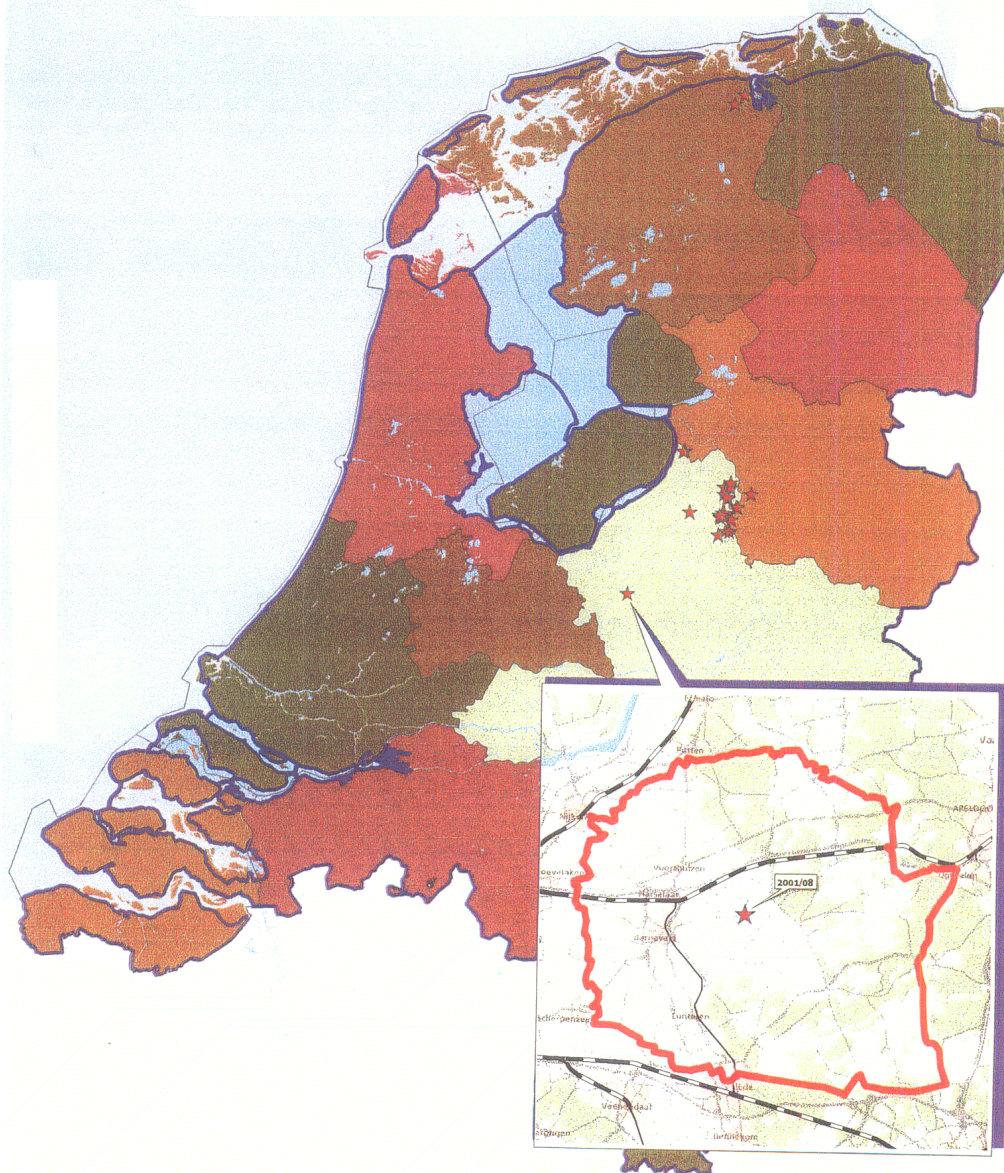


Figure 3: Outbreaks in Oosterwolde

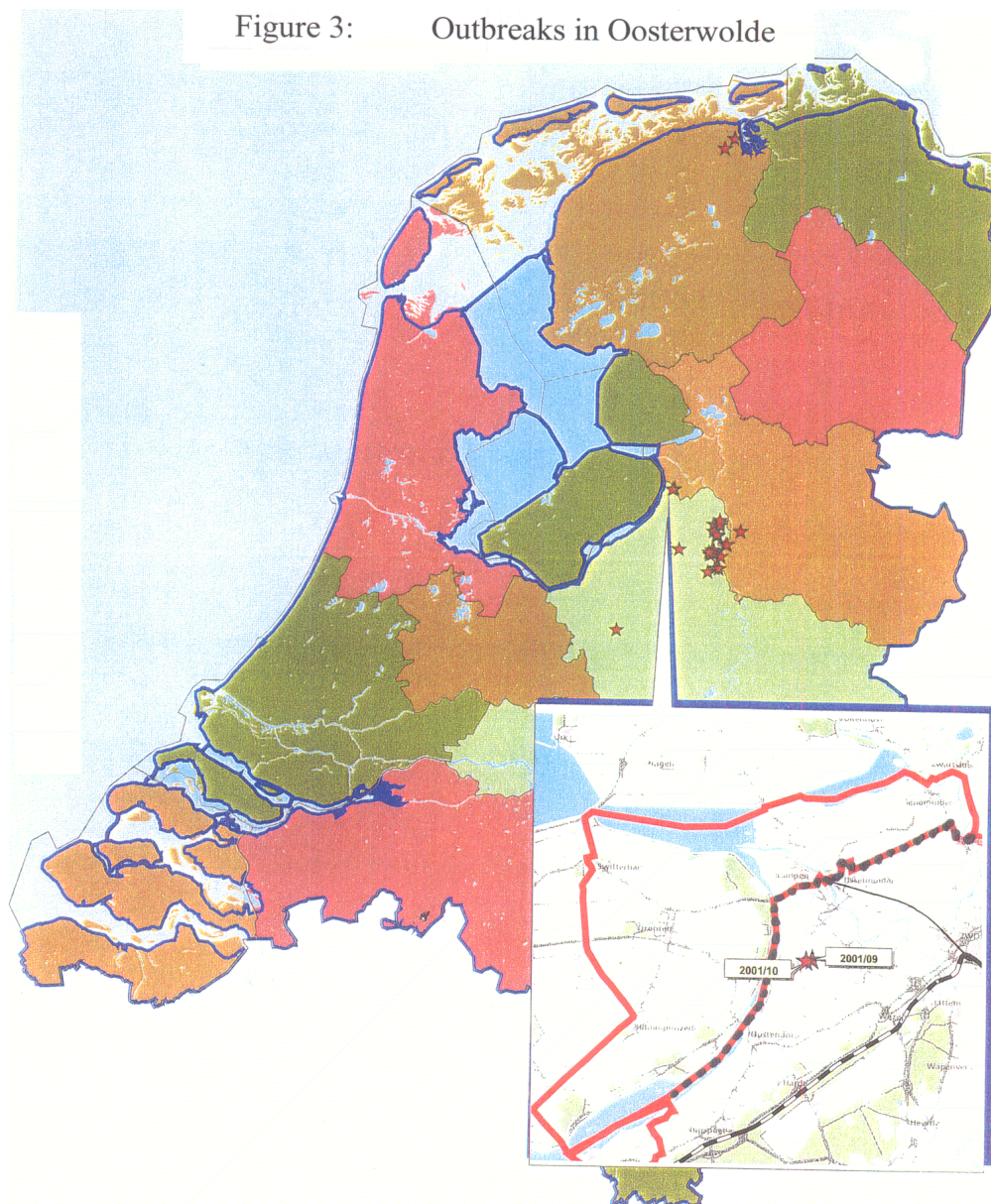


Figure 4: Outbreaks in Noord Friesland

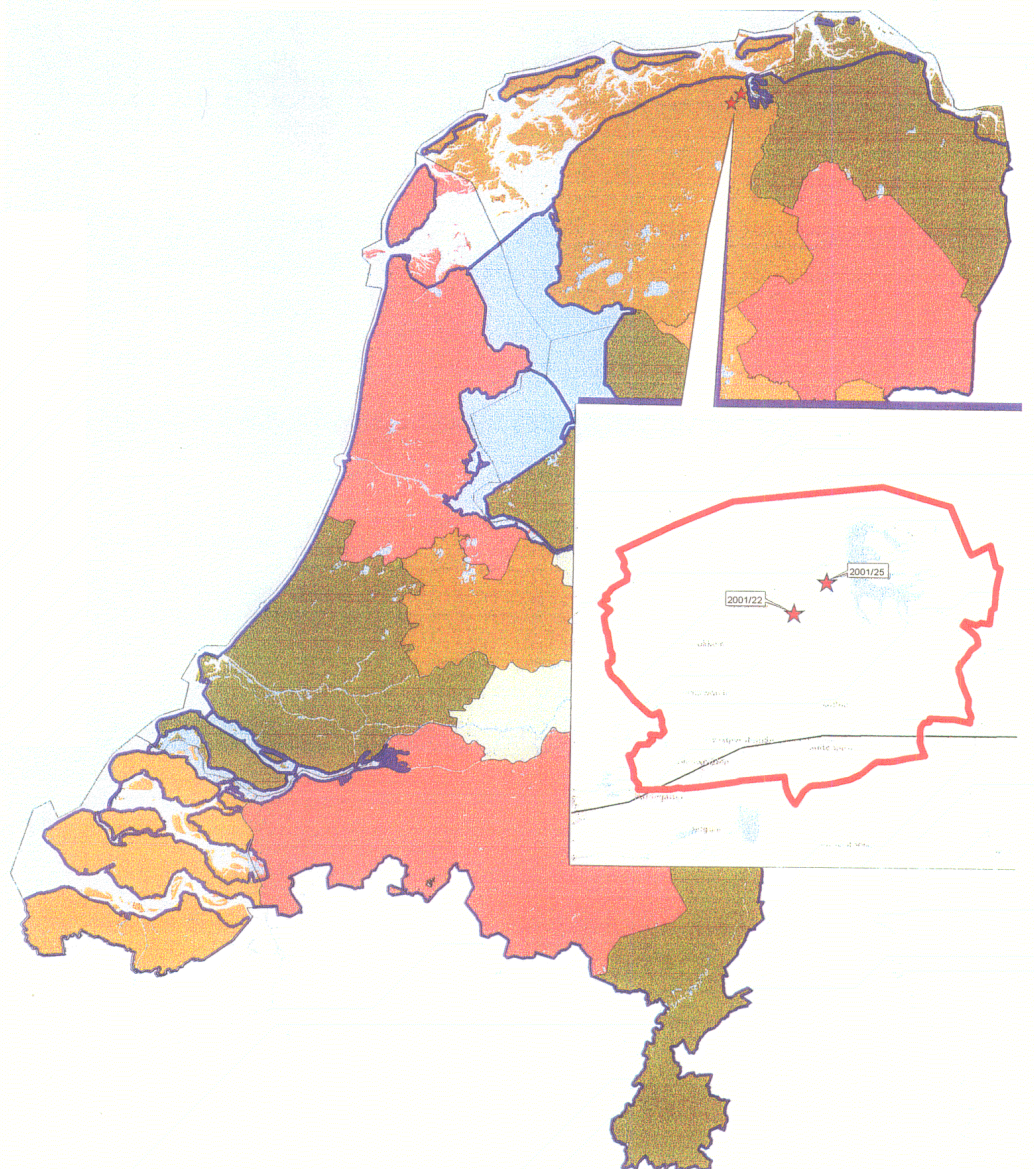
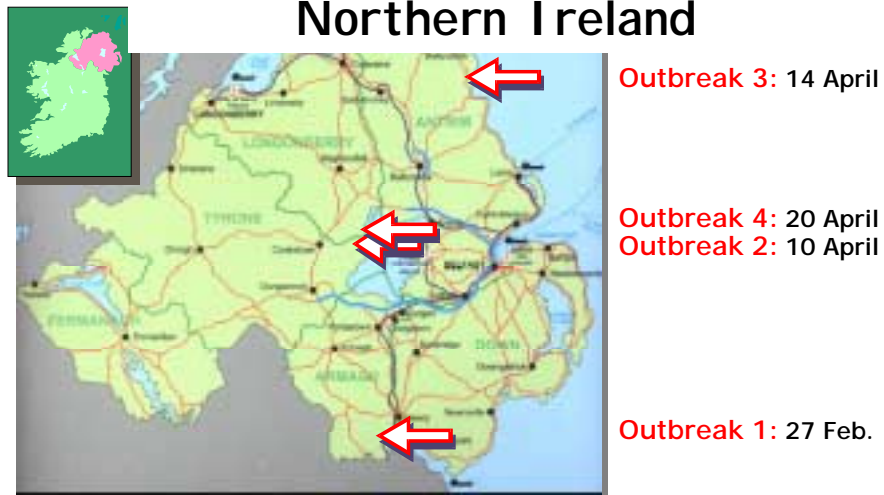


Figure 5: Outbreaks in
Northern Ireland



* Source = DARDNI Agric. Census, June 2000

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